IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S):	Seung-Que LEE et al.	**ART UNIT:**	2617
APPLICATION NO.:	10/583,792	**EXAMINER:**	Steven S. KELLEY
FILING DATE:	April 2, 2007	**DATED:**	August 10, 2010
FOR:			

FOR: WIRELESS INTERNET TERMINAL AND PACKET
TRANSMISSION METHOD FOR IMPROVING QUALITY OF
SERVICE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION

Sir:

In response to the Office Action of the United States Patent and Trademark Office dated
May 10, 2010, and the Advisory Action dated July 20, 2010, please consider the following
amendments and remarks.

IN THE CLAIMS

1. (Currently Amended) An OFDMA-TDMA (Orthogonal Frequency Division Multiple Access-Time Division Multiple Access) based wireless Internet terminal comprising:

a QoS profile storing information about a QoS policy;

a first module, comprising:

a classifier for identifying a type of packet traffic and classifying data packets corresponding to the packet traffic to be transmitted according to the QoS policy stored in the QoS profile, and

an admission controller for determining admission or discarding of the classified data packets provided from a plurality of QoS queues based on a current call state and characteristics of the classified data packets, and

a first priority controller that gives first priorities to the classified data packets according to the QoS policy; and

a second module, comprising:

a PDU maker for generating PDUs from the data packets given the first priorities, and

a second priority controller for determining second priorities of the PDUs according to packet information of the PDUs, wherein the packet information is based on a header or an identifier of a corresponding data packet, and characteristics of the data packets,

a transmitter for arranging the PDUs given the second priorities in an allocated bandwidth to transmit the PDUs;

wherein the first module is constructed in a MAC layer by software and the second module is constructed in the MAC layer by hardware,

wherein the first module further comprises the plurality of QoS queues for dividing and storing the data packets classified by the classifier, and a plurality of priority queues for dividing and storing the data packets admitted by the admission controller based on their priorities,

wherein the classifier identifies the type of packet traffic and stores a data packet of the packet traffic in one of the plurality of QoS queues based on the QoS policy corresponding to the identified type,

wherein the admission controller stores the data packet, which is determined for admission, in one of the plurality of priority queues and discards data packets that have a degree of importance lower than a predetermined degree based on a network state, and

wherein the type of the packet traffic comprises at least one of audio data and burst data. ~~wherein the second module arranges the PDUs in an allocated bandwidth to transmit the PDUs.~~

2. (Currently Amended) The OFDMA-TDMA based wireless Internet terminal as claimed in claim 1, wherein the QoS policy maximizes a bandwidth utilization rate and minimizes a packet loss rate in a current communication environment. ~~the first module further includes an admission controller that determines admission or discard of the data packets classified by the classifier, and wherein the data packets classified by the classifier are data packets that are determined as admitted by the admission controller after being classified by the classifier.~~

3. (Cancelled)

4. (Cancelled)

5. (Currently Amended) The OFDMA-TDMA based wireless Internet terminal as claimed in claim 1, wherein the second module includes a sorting queue sequentially storing the PDUs based on the second priorities assigned by the second priority controller.

6. (Currently Amended) The OFDMA-TDMA based wireless Internet terminal as claimed in claim ~~5,~~ 1, wherein the PDUs are MAC PDUs, and the second priority controller determines which one among an ACK packet, a management message packet and a user data packet, a corresponding packet is, based on headers or identifiers of the MAC PDUs and gives the second priories to the MAC PDUS in the order of ~~an~~ the ACK packet, ~~a~~ the management message packet and ~~a~~ the user data packet independently from the QoS profile.

7. (Currently Amended) The OFDMA-TDMA based wireless Internet terminal as claimed in claim 6, 1, wherein the first priority controller gives data, which requires real-time transmission, a higher priority than data, which tolerates transmission delay, based on the QoS policy. second module is constructed in a MAC layer by hardware.

8. (Currently Amended) A packet processing method in a wireless Internet terminal, comprising:

identifying a type of data traffic and classifying and storing data packets corresponding to the data traffic based on a QoS policy;

determining admission or discarding of the classified data packets based on a current call state and characteristics of the classified data packets;

providing first priories to the data packets that are classified and admitted, based on the QoS policy;

storing the data packets given the first priorities in a queue and sequentially outputting the data packets based on their first priories;

providing second priorities to the data packets outputted from the queue according to packet information of the data packets given based on characteristics of the data packets provided the first priorities independently of the QoS policy, wherein the packet information is based on a header or an identifier of a corresponding data packet; and

arranging sequentially sorting the data packets based on the second priorities to arrange the data packets in an allocated bandwidth. bandwidth;

wherein identifying the type of the data traffic, classifying and storing the data packets, determining admission or discarding of the classified data packets and providing the first priorities to the classified data packets are executed by software, and wherein providing the second priorities to the data packets and arranging the data packets are executed by hardware,

wherein, in classifying and storing data packets, a data packet of the packet traffic is stored in one of a plurality of QoS queues based on the QoS policy corresponding to the identified type,

wherein, in determining admission or discarding of the classified data packets, a data packet, which is determined for admission, is stored in one of a plurality of priority queues, and

wherein the type of the packet traffic comprises at least one of audio data and burst data.

9. (Currently Amended) The packet processing method as claimed in claim 8, wherein arranging the data packets sequentially sorts the data packets based on the second priorities and arranges the sorted data packets in an allocated bandwidth. further comprising determining admission or discard of the classified data packets.

10. (Currently Amended) The packet processing method as claimed in claim 9, 8, wherein providing the second priorities to the data packets determines which one among an ACK packet, a management message packet and a user data packet a corresponding packet is, based on headers or identifiers of MAC PDUs, independently of the QoS policy and gives the second priorities to the MAC PDUs in the order of the ACK packet, the management message packet and the user data packet independently from the QoS profile. the classifying and storing data packets, the determining admission or discard of the classified data packets and the providing of the first priories to the classified data packets are executed by software, and the provided second priorities to the data packets and the arranging the data packets are executed by hardware.

11-14. (Cancelled)

15. (New) The packet processing method as claimed in claim 8, wherein the QoS policy maximizes a bandwidth utilization rate and minimizes a packet loss rate in a current communication environment, and
wherein providing the first priorities to the classified data packets gives data, which requires real-time transmission, a higher priority than data, which tolerates transmission delay, based on the QoS policy.

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Prior to this amendment, Claims 1-14 were pending in the application, with Claims 1, 8 and 11 being the independent claims.

The Examiner rejected Claims 2 and 8-10 under 35 U.S.C. §112, second paragraph. The Examiner rejected Claims 1-14 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,461,164 to *Edwards et al.* (hereinafter, *Edwards*) in view of *Baiocchi et al.*, IP QoS Delivery in a Broadband Wireless Local Loop: MAC Protocol Definition and Performance Evaluation, IEEE Journal on Selected Areas in Communication, Vol. 18, No. 9, September 2000, (hereinafter, *Baiocchi*).

Regarding the §112 rejection, Claims 2 and 8 have been amended and particularly point out and distinctly claim the subject matter of the present invention. Accordingly, Applicants respectfully request withdrawal of the rejection.

Regarding the §103(a) rejection of Claims 1-14, the Examiner contends that each element of the claims is taught, suggested or rendered obvious by the combination of *Edwards* and *Baiocchi*. Specifically, the Examiner contends that *Edwards* teaches or suggests each element of Claim 1 with the exception of a PDU maker for generating PDUs from the data packets given the first priorities, and an OFDMA-TDMA based wireless Internet terminal. The Examiner cites *Baiocchi* in an attempt to remedy these deficiencies.

Claim 1 has been amended to more clearly recite the subject matter of the present invention. Specifically, amended Claim 1 recites that a first module comprises a classifier for identifying a type of packet traffic and classifying data packets corresponding to the packet traffic according to the QoS policy stored in the QoS profile. The first module also comprises an admission controller for determining admission or discarding of the classified data packets

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provided from a plurality of QoS queues based on a current call state and characteristics of the classified data packets. A second module comprises a second priority controller for determining second priorities of the PDUs according to packet information of the PDUs. The packet information is based on a header or an identifier of a corresponding data packet. The second module also comprises a transmitter for arranging the PDUs given the second priorities in an allocated bandwidth to transmit the PDUs. The first module is constructed in a MAC layer by software and the second module is constructed in the MAC layer by hardware. The first module further comprises the plurality of QoS queues for dividing and storing the data packets classified by the classifier, and a plurality of priority queues for dividing and storing the data packets admitted by the admission controller based on their priorities. The classifier identifies the type of packet traffic and stores a data packet of the packet traffic in one of the plurality of QoS queues based on a QoS policy corresponding to the identified type. The admission controller stores the data packet, which is determined for admission, in one of the plurality of priority queues and discards data packets that have a degree of importance lower than a predetermined degree based on a network state. The type of packet traffic comprise s at least one of audio data and burst data.

The combination of *Edwards* and *Baiocchi* also fails to disclose the newly amended elements of Claim 1 recited above.

Claim 1 recites two priority controllers. a first priority controller that gives first priorities to classified data packets according to the QoS policy, and a second priority controller for determining second priorities of PDUs according to characteristics of the data packets. Thus, in Claim 1, the terminal sets two different priorities: one based on a QoS policy for data packets and one based on characteristics of the data packets for PDUs. The PDUs are constructed from the data packets.

Edwards discloses that a software MAC component provides a priority to a packet and selectively writes the packet in a queue according to the priority, and a hardware MAC component stores the packet from the queue to one of the transmission queues that are provided

with priorities. *Edwards* only transmits a packet from one of the transmission queues that are provided with priorities, while the present invention provides the second priorities to the data packets, which are provided with the first priorities, based on the characteristics of the data packets and sorting the data packet based on the second priorities. Therefore, *Edwards* fails to disclose providing a priority to a data packet that has already been provided with another priority, based on the character of the data packet.

Although *Baiocchi* teaches generating PDUs, the combination would only produce a system that continues to operate *Edwards'* hardware-based and software-based MAC components on packets. Therefore, amended Claim 1 is patentable over the combination of *Edwards* and *Baiocchi*.

The Examiner also rejected independent Claims 8 and 11 under 35 U.S.C. §103(a). Claim 11 has been cancelled without prejudice. Claim 8 has been amended in a manner similar to that of Claim 1. In view of the above, amended Claim 8 is also patentable over the combination of *Edwards* and *Baiocchi*.
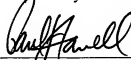
Regarding Claims 2-7, 9, 10 and 12-14, Claims 3, 4 and 12-14 have been cancelled without prejudice. Claim 15 is newly presented. No new matter has been added. While not conceding the patentability of the dependent claims, *per se*, Claims 2, 5-7, 9, 10 and 15 are also patentable for at least the above reasons. Accordingly, Applicants assert that Claims 1, 2, 5-10 and 15 are allowable over the combination of *Edwards* and *Baiocchi*, and the rejection under 35 U.S.C. §103(a) should be withdrawn

Accordingly, all of the claims pending in the Application, namely, Claims 1, 2, 5-10 and 15 are believed to be in condition for allowance. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact Applicants' attorney at the number given below.

Respectfully submitted,

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